

Application No. 10/600,166
Response dated February 13, 2004
Reply to Office Action of December 10, 2003

This listing of claims will replace all prior versions, and listings, of claims in the Application:

Listing of Claims:

Claim 1 (original): A teatcup liner series comprising in combination a family of related teatcup liners, each liner having an upper mouthpiece and a barrel depending downwardly from said upper mouthpiece, said barrel extending axially along an axis for receiving a teat inserted axially thereinto through said

5 mouthpiece, said teatcup liner series comprising n liners L₁ through L_n, wherein the material of at least one of said mouthpiece and said barrel progressively varies in hardness from L₁ to L_n.

Claim 2 (original): The teatcup liner series according to claim 1 wherein the material of said mouthpiece progressively increases in hardness from L₁ to L_n.

Claim 3 (original): The teatcup liner series according to claim 1 wherein the material of said barrel progressively decreases in hardness from L₁ to L_n.

Claim 4 (original): The teatcup liner series according to claim 1 wherein in combination the material of both said mouthpiece and said barrel progressively vary from L₁ to L_n.

Claim 5 (original): The teatcup liner series according to claim 1 wherein the material of said mouthpiece and the material of said barrel vary inversely relative to each other from L₁ to L_n.

Claim 6 (original): The teatcup liner series according to claim 5 wherein in combination the material of said mouthpiece progressively increases in hardness

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from L_1 to L_n , and the material of said barrel progressively decreases in hardness from L_1 to L_n .

Claim 7 (original): A teatcup liner series comprising in combination a family of related teatcup liners, each liner having an upper mouthpiece and a barrel depending downwardly from said upper mouthpiece, said barrel extending axially along an axis for receiving a teat inserted axially thereinto through said

5 mouthpiece, said teatcup liner series comprising n liners L_1 through L_n , a plurality of grooves extending along at least one of said mouthpiece and said barrel, said grooves having a groove width progressively varying from L_1 to L_n .

Claim 8 (original): The teatcup liner series according to claim 7 wherein said groove width extends transversely to said axis.

Claim 9 (original): The teatcup liner series according to claim 8 wherein said grooves extend along said mouthpiece, and said groove width progressively decreases from L_1 to L_n .

Claim 10 (original): The teatcup liner series according to claim 9 wherein said mouthpiece has an upper lip having an aperture therethrough for receiving said teat, and said mouthpiece has a cavity between said lip and said barrel, and said grooves extend along said cavity, and said groove width in said cavity progressively

5 decreases from L_1 to L_n .

Claim 11 (original): The teatcup liner series according to claim 8 wherein said grooves extend axially along said barrel, and said groove width progressively increases from L_1 to L_n .

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Claim 12 (original): The teatcup liner series according to claim 8 wherein said grooves extend along both said mouthpiece and said barrel, said grooves having upper sections in said mouthpiece, and having lower sections in said barrel.

Claim 13 (original): The teatcup liner series according to claim 12 wherein in combination said groove width of said upper sections of said grooves progressively decreases from L_1 to L_n , and said groove width of said lower sections of said grooves progressively increases from L_1 to L_n .

Claim 14 (original): The teatcup liner series according to claim 7 wherein said groove width extends axially.

Claim 15 (original): The teatcup liner series according to claim 14 wherein said mouthpiece has an upper lip having an aperture therethrough for receiving said teat, and said mouthpiece has a cavity between said lip and said barrel, and said grooves extend along said cavity in said mouthpiece.

Claim 16 (original): The teacup liner series according to claim 14 wherein said grooves extend along said barrel, and said groove width progressively increases from L_1 to L_n .

Claim 17 (original): The teatcup liner series according to claim 14 comprising grooves in both said mouthpiece and said barrel.

Claim 18 (original): A teatcup liner comprising an upper mouthpiece and a barrel depending downwardly from said upper mouthpiece, said barrel extending axially along an axis for receiving a teat inserted axially thereinto through said mouthpiece, a plurality of grooves extending along said liner and having a groove width measured transversely to said axis, said grooves having upper sections in

said mouthpiece, said grooves having lower sections extending axially along said barrel, said upper sections of said grooves having a different groove width than said lower sections of said grooves.

Claim 19 (original): The teatcup liner according to claim 18 wherein said upper sections of said grooves have a larger said groove width than said lower sections of said grooves.

Claim 20 (original): The teatcup liner according to claim 18 wherein said upper sections of said grooves have a smaller said groove width than said lower sections of said grooves.

Claim 21 (original): The teatcup liner according to claim 18 wherein said mouthpiece has an upper lip having an aperture therethrough for receiving said teat, and said mouthpiece has a cavity between said lip and said barrel, said grooves

5 extend upwardly along said barrel and then along said cavity and said lip to said aperture, and comprising groove transition sections along said cavity transitioning said grooves to said different groove width.

Claim 22 (original): A method for making a teatcup liner series having in combination a plurality of related teatcup liners, each liner having an upper mouthpiece, an intermediate barrel defined by a barrel wall, and a lower connecting tube, said barrel extending along an axial direction for receiving a teat inserted

5 axially thereinto through said mouthpiece, said mouthpiece having an upper lip having an aperture therethrough for receiving said teat, said teat liner series comprising n said liners L₁ through L_n, each said liner having an outer profile surface and an inner profile surface, said method comprising:

10 forming a first of said liners L₁ in a mold having a first removable core C₁ inserted therein, said mold forming the outer profile surface of liner L₁, said core C₁ forming the inner profile surface of liner L₁;

forming a second of said liners L₂ in the same said mold having a second removable core C₂ inserted therein, said mold forming the outer profile surface of liner L₂, said core C₂ forming the inner profile surface of liner L₂;

15 forming the remainder of said liners through L_n in the same said mold having respective removable cores through C_n inserted therein, said mold forming the outer profile surface of said liners through L_n, said cores through C_n forming the inner profile surfaces of the liners through L_n,

wherein:

20 the same said mold is used for each of said liners L₁ through L_n;

the outer profile surface is the same for each of said liners L₁ through L_n;

different cores C₁ through C_n are used for said liners L₁ through L_n;
and

25 said inner profile surface is different liner to liner according to C₁ through C_n.

Claim 23 (original): The method according to claim 22 wherein said n liners L₁ through L_n have at least one selected parameter which varies liner to liner, and wherein said selected parameter varies liner to liner according to C₁ through C_n.

Claim 24 (original): The method according to claim 23 wherein said selected parameter is a dimension.

Claim 25 (original): The method according to claim 24 wherein said lip has an axial thickness measured parallel to said axial direction, and said parameter is said axial thickness of said lip.

Claim 26 (original): The method according to claim 24 wherein said barrel wall has a transverse thickness measured transversely to said axial direction, and said parameter is said transverse thickness of said barrel wall.

Claim 27 (original): The method according to claim 24 wherein said barrel wall has inner surfaces defining a hollow interior with a transverse span thereacross taken transversely to said axial direction, and wherein said parameter is said transverse span.

Claim 28 (original): The method according to claim 24 wherein said lip aperture has a transverse dimension taken transversely to said axial direction and defining a mouthpiece bore, and wherein said parameter is said mouthpiece bore.

Claim 29 (original): The method according to claim 24 wherein said mouthpiece has a cavity between said lip and said barrel, and said cavity has a transverse dimension taken transversely to said axial direction and defining a cavity bore, and wherein said parameter is said cavity bore.

Claim 30 (original): The method according to claim 24 wherein said mouthpiece has a cavity between said lip and said barrel, said cavity having a volume, and wherein said parameter is said cavity volume.

Claim 31 (original): A teatcup liner series comprising in combination a plurality of related teatcup liners, each liner having an upper mouthpiece, an intermediate barrel defined by a barrel wall, and a lower connecting tube, said barrel extending along an axial direction for receiving a teat inserted axially thereinto through said mouthpiece,
5 said mouthpiece having an upper lip having an aperture therethrough for receiving said teat, said teatcup liner series comprising n said liners L₁ through L_n having at least one selected parameter which varies liner to liner, wherein:

said lip has an axial thickness measured parallel to said axial direction;

10 said barrel wall has a transverse thickness measured transversely to said axial direction;

said parameter is the difference between said axial thickness of said lip and said transverse thickness of said barrel wall; and

said difference increases linearly from L₁ through L_n.

Claim 32 (original): A teatcup liner series comprising in combination a plurality of related teatcup liners, each liner having an upper mouthpiece, an intermediate barrel defined by a barrel wall, and a lower connecting tube, said barrel extending along an axial direction for receiving a teat inserted axially thereinto through said mouthpiece,
5 said mouthpiece having an upper lip having an aperture therethrough for receiving said teat, said teatcup liner series comprising n said liners L₁ through L_n having at least two selected parameters which vary liner to liner, wherein:

said lip has an axial thickness measured parallel to said axial direction;

10 said barrel wall has a transverse thickness measured transversely to said axial direction;

one of said parameters is the difference between said axial thickness of said lip and said transverse thickness of said barrel wall; and

said difference increases from L_1 through L_n .

Claim 33 (original): A teatcup liner series comprising in combination a plurality of related teatcup liners, each liner having an upper mouthpiece, an intermediate barrel defined by a barrel wall, and a lower connecting tube, said barrel extending along an axial direction for receiving a teat inserted axially thereinto through said mouthpiece,
5 said mouthpiece having an upper lip having an aperture therethrough for receiving said teat, said teatcup liner series comprising n said liners L_1 through L_n having at least two selected parameters which vary liner to liner, wherein:

said lip has an axial thickness A measured parallel to said axial direction;

10 said barrel wall has a transverse thickness B measured transversely to said axial direction;

one of said parameters is A;

another of said parameters is B; and

A and B vary inversely and linearly relative to each other from L_1 through L_n .

Claim 34 (original): A teatcup liner series comprising in combination a plurality of related teatcup liners, each liner having an upper mouthpiece, an intermediate barrel defined by a barrel wall, and a lower connecting tube, said barrel extending along an

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axial direction for receiving a teat inserted axially thereinto through said mouthpiece,
5 said mouthpiece having an upper lip having an aperture therethrough for receiving
said teat, said teatcup liner series comprising n said liners L₁ through L_n having at
least three selected parameters which vary liner to liner, wherein:

said lip has an axial thickness A measured parallel to said axial direction;

10 said barrel wall has a transverse thickness B measured transversely to said
axial direction;

one of said parameters is A;

another of said parameters is B; and

A and B vary inversely relative to each other from L₁ through L_n.

Claim 35 (previously presented): A teatcup liner series comprising in combination
a family of related teatcup liners, each liner having an upper mouthpiece and a
barrel depending downwardly from said upper mouthpiece, said barrel extending
axially along an axial direction for receiving a teat inserted axially thereinto
5 through said mouthpiece, said mouthpiece having an upper lip having an aperture
therethrough for receiving said teat, said teatcup liner series comprising in
combination n said liners L₁ through L_n having at least one selected parameter which
varies liner to liner, said lip having an axial thickness measured parallel to said axial
direction, wherein said parameter is said axial thickness of said lip.

Claim 36 (previously presented): The teatcup liner series according to claim 35
wherein said axial thickness of said lip progressively increases from L₁ through L_n.

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Claim 37 (previously presented): A teatcup liner series comprising in combination a family of related teatcup liners, each liner having an upper mouthpiece and a barrel depending downwardly from said upper mouthpiece, said barrel extending axially along an axial direction for receiving a teat inserted axially thereinto

5 through said mouthpiece, said teatcup liner series comprising n said liners L_1 through L_n having at least one selected parameter which varies liner to liner, each liner having at least one groove extending along said mouthpiece, wherein said parameter is at least one of the size and number of said grooves.

Claim 38 (previously presented): The teatcup liner series according to claim 37 wherein said parameter is said size of said grooves, and wherein said size of said grooves varies liner to liner.